

WHAT IS CLAIMED IS:

1. A liquid crystal display device comprising a periodically switching light source repeatedly turning ON and OFF at a predetermined timing and a display unit for displaying an image by controlling light transmission or reflection of the periodically switching light source according to the image data,

wherein write into the liquid crystal display device in each display frame constituting an image is divided into a first write for writing into all the pixels using precharge data as representative of a plurality of pixels created according to a first algorithm and a second write for additionally writing overwriting data created on at least some pixels according to a second algorithm, thereby displaying an image.

2. A liquid crystal display device as claimed in claim 1, wherein the display unit includes a liquid crystal layer sandwiched by two substrates at least one of which is transparent, a plurality of row wires and a plurality of column wires on one of the two substrates, and active elements on the intersections between the row wires and the column wires, so that image data is written by dot sequentially or line sequentially via the active elements into the pixels arranged in a matrix.

3. A liquid crystal display apparatus as claimed in claim 2, wherein precharge data used for the first

write is composed of image data representative of image data of a plurality of desired rows and an image composed of the desired rows is written by the precharge data.

4. A liquid crystal display device as claimed in claim 3, wherein the precharge data is composed of image data extracted by every other  $j$  rows from predetermined rows.

5. A liquid crystal display device as claimed in claim 3, wherein the precharge data is composed of a column-direction average value of image data consisting of  $j$  rows in the vicinity.

6. A liquid crystal display device as claimed in claim 3, wherein the precharge data consists of data of the slowest response time in the data change from the preceding frame among the  $j$  data pieces of the same column in the image data of  $j$  rows in the vicinity.

7. A liquid crystal display device as claimed in claim 1, wherein the liquid crystal display unit writes image data dot sequentially or line sequentially into the pixels arranged in a matrix state via the active elements, thereby maintaining and displaying the image for a certain period, the periodically switching light source periodically turns ON and OFF in synchronization with the display timing of the liquid crystal display unit, and

during the first write, a plurality of rows are simultaneously selected so that image data of one

of the rows is written and during the second write, the remaining image data is successively written at once or divided into a plurality of sub-fields on row basis for writing.

8. A liquid crystal display device as claimed in claim 7, wherein in the second writing, the remaining image data is divided into a plurality of sub-fields for writing and write polarity is reversed for each row.

9. A liquid crystal display device as claimed in claim 8, in the latter half of the display frame, by using the image data used in the first half of the frame, third write and fourth write are added with reversed polarity.

10. A liquid crystal display device comprising a liquid crystal display unit having a liquid crystal layer sandwiched by two substrates at least one of which is transparent, a plurality of row wires and a plurality of column wires on one of the two substrates, and active elements on the intersections between the row wires and the column wires, so that image data is maintained for a certain time and written by dot sequentially or line sequentially via the active elements into the pixels arranged in a matrix, and a periodically switching light source periodically turning ON and OFF in synchronization with the display timing of the liquid crystal display unit,

wherein interlaced image data is input, each

image data is assigned to a pair of rows, the start row is alternately changed in the odd-number field and the even-number field, in each display field constituting one image, write to the liquid crystal display unit is divided for display into a first write for high-speed writing of all the pixels during an OFF period of the periodically switching light source by using the precharge data capable of rough image display and a second write for additionally writing interpolation data to at least some of the pixels which have performed the first write, thereby displaying detailed image data, and by using the image data used in the first half of the field, a third write and a fourth write are added with reversed polarity.

11. A liquid crystal display device as claimed in claim 10, wherein during the first write, two pairs of rows are simultaneously selected and image data of one of the pairs of rows is written and during the second write, one pair of rows is simultaneously selected and interlaced scan on two-pair basis is performed to write the remaining image data, and in the latter half of the display field, the image data used in the first half of the field is used so that a third write and a fourth write are added with reversed polarity.

12. A liquid crystal display device as claimed in claim 9, wherein the write polarity in one sub-field is made identical and a selection period of an arbitrary row is overlapped with the selection period of the next

row selected.

13. A liquid crystal display device as claimed in claim 12, wherein the periodically switching light source is lit at a desired timing after the second write is complete.

14. A liquid crystal display device comprising a liquid crystal display unit having a liquid crystal layer sandwiched by two substrates at least one of which is transparent, a plurality of row wires and a plurality of column wires on one of the two substrates, and active elements on the intersections between the row wires and the column wires, so that image data is maintained for a certain time and written by dot sequentially or line sequentially via the active elements into the pixels arranged in a matrix, and a periodically switching light source periodically turning ON and OFF in synchronization with the display timing of the liquid crystal display unit,

wherein the periodically switching light source consists of a plurality of light source blocks whose lighting timings can respectively be controlled in synchronization with the display timing of the liquid crystal display unit,

the liquid crystal display device further comprising a high-speed writing circuit for increasing the speed of the writing input image data from an external image source higher than the acquisition speed and writing it in the liquid crystal display unit.

15. A liquid crystal display device as claimed in claim 14, wherein a number  $p$  of the light source blocks and a ratio  $q$  of the image acquisition speed with respect to the write speed are both greater than 1.

16. A liquid crystal display device as claimed in claim 15, wherein a product  $p \times q$  of the number  $p$  of the light source blocks and the ratio  $q$  of the image acquisition speed with respect to the write speed is greater than 3.

17. A liquid crystal display device as claimed in claim 14, wherein the high-speed writing circuit for increasing the speed higher than the acquisition speed when writing into the liquid crystal display unit is a circuit for dividing in each display field constituting one image, write to the liquid crystal display unit into a first write for high-speed writing of all the pixels during an OFF period of the periodically switching light source by using the precharge data capable of rough image display and a second write for additionally writing detailed image data to at least some of the pixels which have performed the first write.